of Science (about twelve or fourteen years ago) will show the numerous additional fossils which he got, all with the same geological significance, as I stated, though said to be simply an impossibility by Mr. Clarke.

8th. The matter of the Lepidodendron from the Manilla river (but not, as it should be for the argument, from the *Glossopteris* beds) will be well understood from my former "Commentary." On communicating, two days ago, with Mr. Selwyn, he reiterates his possitive assertion that he told Mr. Clarke of the Gipps Land *Lepidodendron* in our Museum, and brought him to the case, and pointed it out to him; the insinuation of Mr. Clarke was that he discovered an important fossil in our national collection, of the nature of which we were ignorant. Mr. Selwyn is aware that I determined its true nature at the first glance, some years before, and that he expressly pointed it out and explained it to Mr. Clarke. Further, Mr. Selwyn (who was present) again authorises me to say that the account I have given in the "Commentary" exactly coincides with the distinct impression he received from Mr. Clarke's account of the coalpits at Stoney Creek; he remembers perfectly, as I do, the sections drawn with a pencil, by Mr. Clarke, illustrating his statement—that the pit was sunk through the plant beds near the surface into the marine beds, and that he had not been there, and had no evidence that the plant specimen had actually been *in situ* below the marine beds.

ART. XV.—*On the Multisection of an Angle by means of the Cycloid.* By the Hon. DAVID ELLIOT WILKIE, M.D., M.L.C.

[With a Plate.]

[Read before the Royal Society of Victoria, 25th June, 1860.]

THE writer of this paper feels that he owes some apology for venturing to offer a new illustration of the trisection or multisection of an angle. He has devoted very little time to mathematical studies, and his attention was directed, quite accidentally, to the subject of this paper.

It is well known that there is no mode by which this problem can be solved by pure Geometry, that is, by circles and straight lines.

There are several other curves, however, by means of which an angle may be trisected, but these curves are difficult to be described, as the hyperbola, trisectrix, quadratrix, &c. The trisection of an angle, therefore, by means of these curves, possesses little practical interest.

The object of the writer is to point out that the properties of the cycloid afford a ready means of trisecting or multisecting any angle. The cycloid differs from the other curves above-mentioned in the comparative facility with which a perfectly accurate figure may be obtained. Indeed there is no reason why, by a simple mechanism, the cycloid may not be figured with as much mathematical precision as the circle itself.

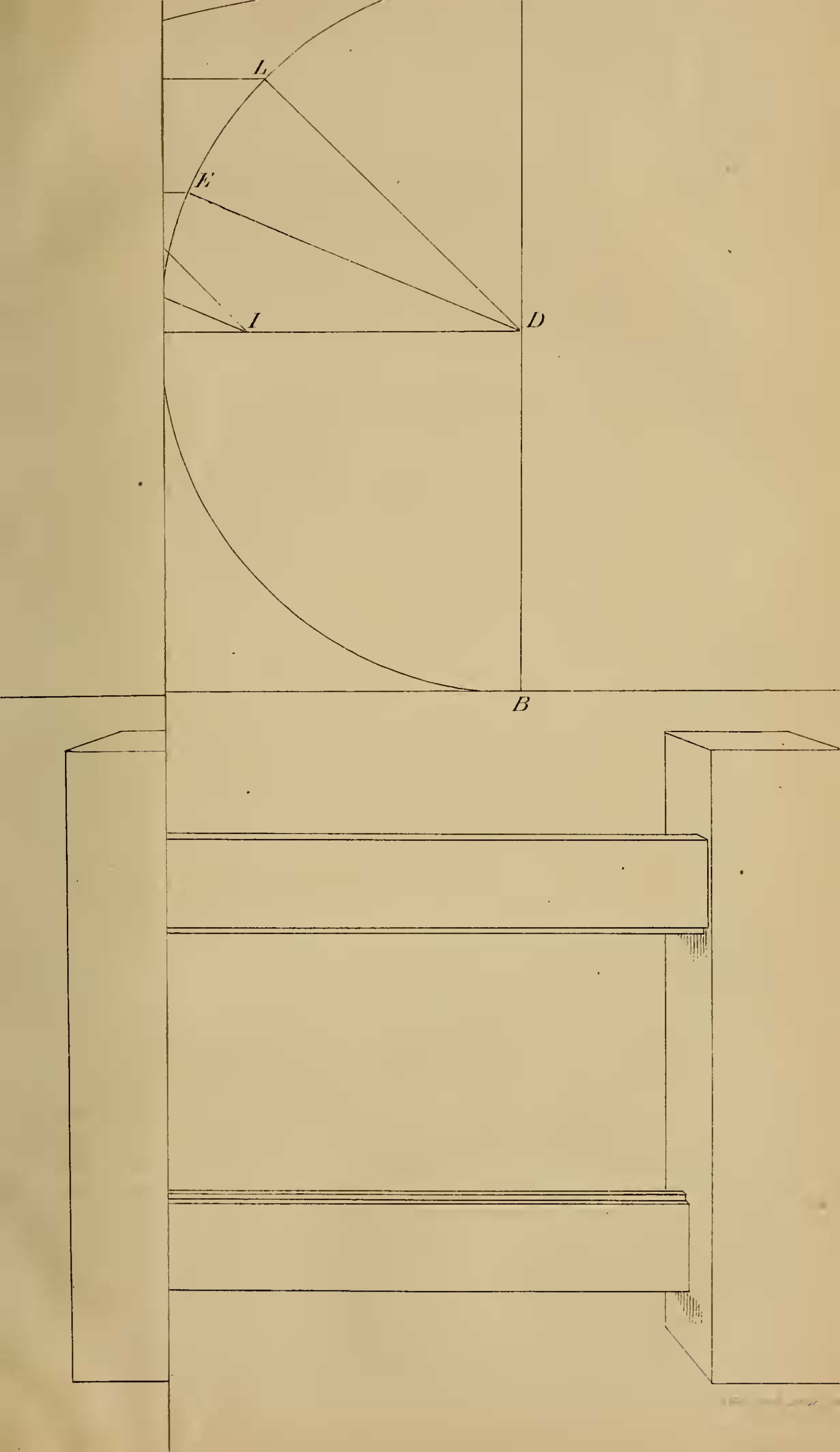
The cycloid, also, is a curve which is nearly allied to the circle, and its properties, which are derived from this relation, are readily understood. There is another property of the cycloid which the writer has not seen noticed before, viz., that there is a point in the curve where its cord becomes a tangent of the generating circle, and is exactly equal to the arc of the circle contained between this point and the base of the cycloid, which becomes the opposite tangent. At this point, therefore, two tangents of the generating circle are each equal to the arc of the circle, which they enclose, that is, each tangent is equal to twice its own arc.

This property of the cycloid appeared to the writer to offer some clue to a geometrical quadrature of the circle. In this expectation he was disappointed. It was, however, in directing his attention to the possible solution of this problem by means of the cycloid, that he discovered that property of this curve by which any angle may be readily divided into any number of equal parts.

In order to obtain a perfectly accurate figure of the cycloid, the writer has designed a simple instrument, which is figured in the accompanying plate. It consists of two wheels, of different sizes, attached together by the same pivot, and confined between two parallel bars, on one of which each wheel rolls. A lead point, to describe the curve, is fixed in the flange of the larger wheel, exactly opposite its rolling edge.

The two wheels are in contact with each other, and, when in motion, rotate in opposite directions. The upper bar is in a different plane from the lower, to receive the smaller wheel.

The side pieces of the instrument are at right angles to the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